ORDER NO. SD81071976C8

Service Manual

Turntable System

SL-D212

[E], [EK], [XL], [EG], [EB],
[EF], [XA], [XM], [EH], [Ei], [EC]

SL-D212(K)

[E], [EK], [XL],
[EG], [EB], [EF], [XM]

- ***The colors of this model include silver and black.**
- ***The black type model is provided with (K) in the Service Manual.**

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.
- * [EH] is available in Holland.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.

English

Specifications

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown approximate.

■ General

Power supply:	~110–120/220–240V, 50 or 60 Hz
Power consumption:	7 W
Dimensions: (W×H×D)	43×10.6×37.5 cm (16-15/16''×4-7/32''×14-3/4'') (Maximum height when top (dust cover) is open. 43×37×42 cm 16-15/16''×14-9/16''×16-17/32'')
Weight:	5 kg (11 lb.)

■ Turntable section

Type:	Automatic turntable Auto return Auto stop Manual play
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	F·G servo control
Turntable platter	Aluminum die-cast Diameter 31.2 cm (12-9/32'')
Turntable speeds:	33-1/3 rpm and 45 rpm
Pitch control:	10% adjustment range
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (IEC 98A Weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	−56 dB (IEC 98A Unweighted) −78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Universal tonearm ''S'' shaped tubular arm Static balanced type
Effective length:	230 mm (9-1/16'')
Overhang:	15 mm (19/32'')
Tracking error angle:	Within 2°32′ at the outer groove of 30 cm (12'') record Within 0°32′ at the inner groove of 30 cm (12'') record
Offset angle:	22°
Friction:	Less than 7 mg (lateral, vertical)
Effective mass:	11 g (without cartridge)
Stylus pressure adjustment range:	0–2.5 g
Applicable cartridge weight range:	5—7.5 g
Headshell weight:	8 g
Phono cable capacitance:	135 pF

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ Cartridge section

(EPC-U25S)

Type: Moving magnet
Frequency response: 10 Hz to 35 kHz
20 Hz to 10 kHz ± 1 dB
Output voltage: 2.5 mV at 1 kHz
5 cm/s. zero to peak lateral velocity
(7 mV at 1 kHz 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation: 22 dB at 1 kHz
Channel balance: Within 1.8 dB at 1 kHz
Compliance (dynamic): 10×10^{-6} cm/dyne at 100 Hz
Stylus pressure: 1.75 ± 0.25 g (17.5 ± 2.5 mN)
Load impedance: 47 kΩ to 100 kΩ
Weight: 5 g (cartridge only)
Replacement stylus: EPS-25CS
(Equivalent replacement stylus: EPS-25ES)

Deutsch

TECHNISCHE DATEN

Änderungen de technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind circa Werte.

■ Allgemeine Daten

Stromversorgung: ~110–120/220–240 V, 50/60 Hz Wechselstrom
Leistungsaufnahme: 7 W
Abmessungen (B×H×T): 43×10,6×37,5 cm
(Maximale Höhe bei vollständing geöffnetem Oberteil (Staubabdeckung) 43×37×42 cm)
Gewicht: 5 kg

■ Plattenspieler

Typ: Automatischer Plattenspieler
Rückführautomatik
Stopautomatik
Manueller Betrieb
Antrieb: Direktantrieb
Motor: Kollektorloser Gleichstrommotor
Antriebsregel-Methode: FG-Servo-Steuerung
Plattenteller: Aluminium-Spritzguß
Durchmesser 31,2 cm
Plattenteller-Drehzahlen: 33-1/3 und 45 U/min
Drehzahl-Feinregulierung: 10% Einstellbereich
Gleichlaufschwankungen: 0,012% WRMS*
0,025% WRMS (JIS C5521)
±0,035% Spitze
(IEC 98A bewertet)

*Diese Nennleistung bezieht sich auf das Laufwerk-Bauteil allein, ausschließlich Einflüsse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller. Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

Rumpel-Fremdspannungsabstand: −56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand: −78 dB (IEC 98A bewertet)

■ Tonarm

Typ: Universal-Tonarm
S-förmiger Rohrtonarm
Statisch ausbalanciert
Effektive Länge: 230 mm
Überhang: 15 mm
Spurfehlwinkel: 2°32′ bei der Einlaufrille einer 30 cm-Platte
0°32′ bei der Auslaufrille einer 30 cm-Platte
Kröpfungswinkel: 22°
Lagerreibung: Weniger als 7 mg (horizontal, vertikal)
Effektive Masse: 11 g (ohne Tonabnehmer)
Auflagekraft-Einstellbereich: 0—2,5 g
Zulässiger Tonabnehmer-Gewichtbereich: 5—7,5 g
Tonarmkopf-Gewicht: 8 g
Phonokabl-Kapazitanz: 135 pF

■ Tonabnehmer

(EPC-U25S)

Typ: Magnetischer Tonabnehmer
Frequenzgang: 10 Hz bis 35 kHz
20 Hz bis 10 kHz ± 1 dB
Ausgangsspannung: 2,5 mV bei 1 kHz
5 cm/s. Null-zu-Spitze, lateral
[7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Kanaltrennung: 22 dB bei 1 kHz
Kanalabweichung: Innerhalb 1,8 dB bei 1 kHz
Nachgiebigkeit (dynamisch): 10×10^{-6} cm/dyn bei 100 Hz
Auflagekraft: 1,75 ± 0,25 g (17,5 ± 2,5 mN)
Impedanz: 47 kΩ bis 100 kΩ
Gewicht: 5 g (nur Tonabnehmer)
Ersatznadel: EPS-25CS
(Gleichwertiger Ersatztonabnehmer: EPS-25ES.)

Français

CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

■ Généralités

Alimentation:	Alternatif 110-120/220-240V, 50 ou 60 Hz
Consommation:	7 W
Dimensions: **(L × H × P)**	43 × 10,6 × 37,5 cm (Hauteur maximum lorsque le dessus (couvercle protège-poussière) est ouvert. 43 × 37 × 42 cm)
Poids:	5 kg

■ Platine de lecture

Type:	Platine automatique Retour automatique Arrêt automatique Audition à commande manuelle
Système d'entraînement:	Entraînement direct
Moteur:	Moteur C.C. sans balai
Groupe de réglage:	Servocommande du générateur de fréquences
Plateau de lecture:	En aluminium moulé sous pression Diamètre 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t/p.m
Réglage d'écart:	Plage de réglage de 10%
Pleurage et scintillement:	0,012% de valeur efficace* 0.025% de valeur efficace (JIS C5521) ±0,035% de crête (IEC 98A Pondéré)

*Ce régime nominal se rapporte à l'ensemble du tourne-disque seul, excluant les effets du disque, de la cellule pick-up ou du bras de lecture, mais comprenant le plateau. Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement:	−56 dB (IEC 98A Non pondéré) −78 dB (IEC 98A Pondéré)

■ Bras de lecture

Type:	Bras de lecture universel Bras tubulaire en forme de "S" De type à équilibrage statique
Longueur effective:	230 mm
Porte-à-faux:	15 mm
Angle d'erreur de piste:	En deçà de 2 32' au sillon extérieur d'un disque de 30 cm En deçà de 0 32' au sillon intérieur d'un disque de 30 cm
Angle de décalage:	22
Frottement:	Moins de 7 mg (latéral et vertical)
Masse réelle:	11 g (sans la cellule pick-up)
Plage de réglage de la pression d'appui:	0–2.5 g
Gamme du poids des cellules pick-up utilisables:	5—7,5 g
Poids de la coque porte-cellule:	8 g
Capacitance propre du câble pick-up:	135 pF

■ Cellule pick-up (EPC-U25S)

Type:	Aimant mobile
Réponse en fréquence:	10 Hz à 35 kHz 20 Hz à 10 kHz ± 1 dB
Tension de sortie:	2,5 mV à 1kHz; 5 cm/s., zéro à vitesse latérale de crête (7 mV à 1 kHz 10 cm/s., zéro à vitesse 45 de crête [DIN 45 500])
Séparation de canal:	22 dB à 1kHz
Equilibrage des canaux:	En deçà de 1,8 dB à 1 kHz
Elasticité (dynamique):	10×10^{-6} cm/dyne à 100 Hz
Pression de la pointe de lecture:	1,75 ± 0,25 g (17,5 ± 2,5 mN)
Impédance de charge:	47 kΩ to 100 kΩ
Poids:	5 g (cellule seule)
Pointe de lecture de remplacement:	EPS-25CS (Pointe de lecture de remplacement équivalente: EPS-25ES.)

Español

ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son aproximados.

■ En general

Alimentación de corriente:	~110—120/220—240 V, 50 ó 50 Hz
Consumo de corriente:	7W
Dimensiones: **(Ancho×Alto×Prof.)**	43×10,6×37,5 cm Altura máxima cuando la parte de arriba (tapa contra el polvo) está abierta. 43×37×42 cm
Peso:	5 kg

■ Sección del plato giratorio

Tipo:	Plato giratorio automático Retorno automático Parada automática Ejecución manual
Método de accionamiento:	Accionamiento directo
Motor:	Motor de corriente continua sin escobillas

Método de control de accionamiento:	Sevocontrol por generador de frecuencias
Platillo del plato giratorio:	Aluminio fundido Diámetro 31,2 cm
Velocidades del plato giratorio:	33-1/3 y 45 rpm
Control de altura de sonido:	Ambito de ajuste de 10%
Ululaciones y trémolo:	0,012% WRMS 0,025% WRMS (JIS C5521) ±0,035% cresta (IEC 98A Ponderado)

* Estas características se refieren únicamente al conjunto del plato giratorio, con exclusión de los efectos provenientes del disco, cartucho o del brazo sonoro, incluyendo, empero, el platillo. La medida fue tomada por medio de la señal obtenida del generador de frecuencia incorporado del conjunto del motor.

Ruido de rodadura:	−56 dB (IEC 98A No ponderado) −78 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo:	Brazo sonoro universal Brazo tubular en forma de "S" Tipo equilibrado estático
Longitud efectiva:	230 mm
Proyección:	15 mm
Angulo de error de seguimiento:	Inferior a 2°32′ en el surco exterior de un disco de 30 cm Inferior a 0°32′ en el surco interior de un disco de 30 cm
Angulo de descentramiento:	22°
Fricción:	Menos de 7 mg (en sentido lateral y vertical)
Masa efectiva:	11 g (sin cartucho)
Radio de ajuste de la presión de la aguja:	0 a 2,5 g
Radio de peso de cartucho utilizable:	5—7,5 g
Peso de la cápsula de la cabeza:	8 g
Capacitancia de cable de fono:	135pF

■ Sección del cartucho **(EPC-U25S)**

Tipo:	Imán móvil
Respuesta de frecuencia:	de 10 Hz a 35 kHz de 20 Hz a 10 kHz±1 dB
Voltaje de salida:	2,5 mV a 1 kHz Con velocidad lateral der cero a cresta de 5 cm/s [7 mV a 1 kHz Velocidad de 45°de cero a cresta de 10 cm/s (DIN 45 500)]
Separación de canales:	22 dB a 1 kHz
Equilibrio de canales:	Sin exceder 1,8 dB a 1 kHz
Elasticidad (dinámica):	10×10^{-6} cm/dina a 100 Hz
Presión de la aguja:	1,75±0,25 g (17,5±2,5 mN)
Impedancia de carga:	47 kΩ a 100 kΩ
Peso:	5 g (cartucho sólo)
Aguja de recambio:	EPS-25CS (Aguja de recambio equivalente: EPS-25ES.)

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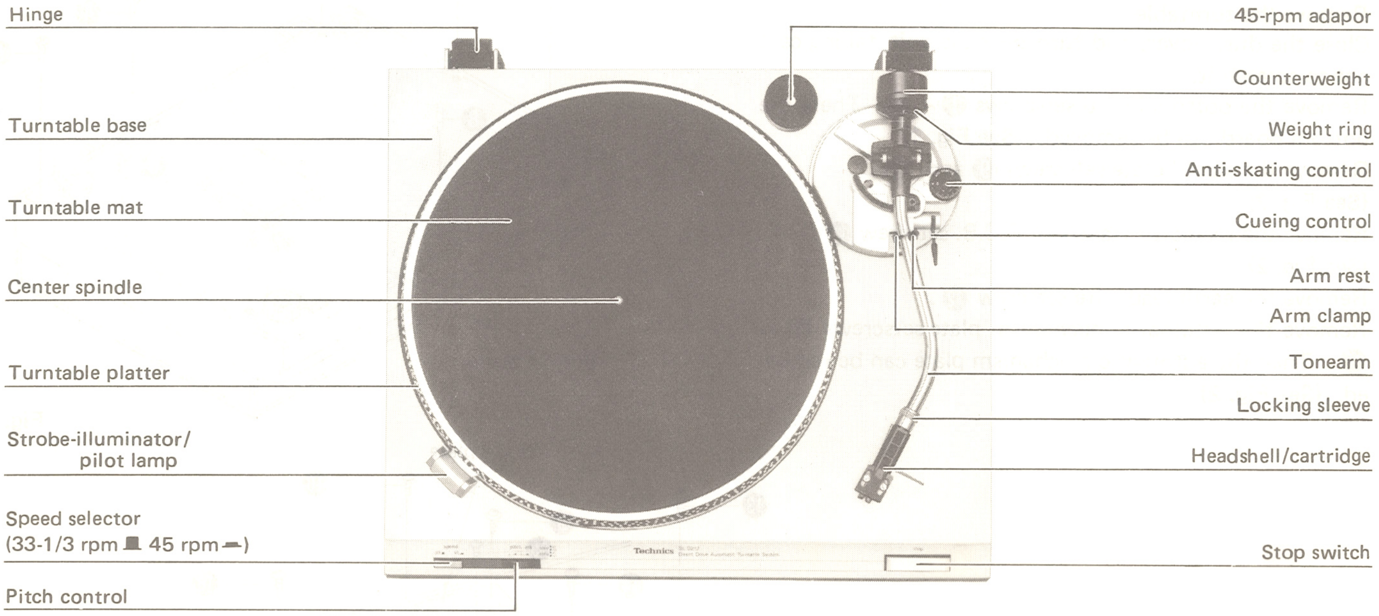
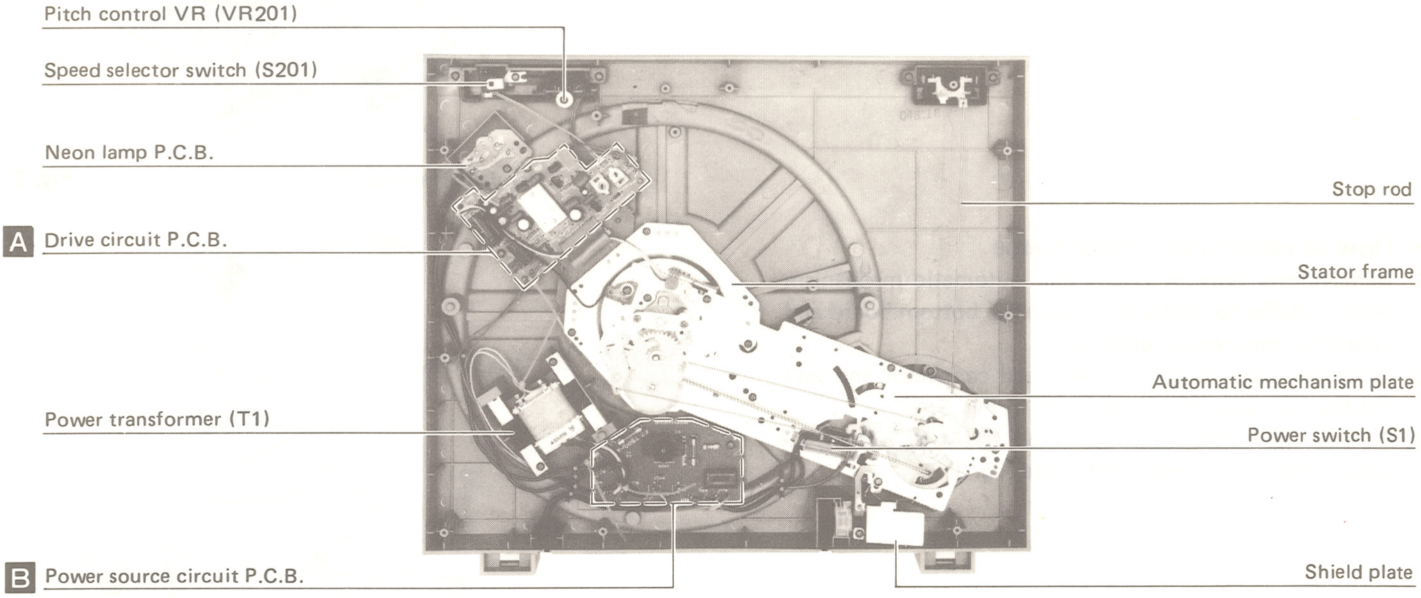
LOCATION OF CONTROLS


Hinge
Turntable base
Turntable mat
Center spindle
Turntable platter
Strobe-illuminator/ pilot lamp
Speed selector (33-1/3 rpm ▀ 45 rpm ▬)
Pitch control
45-rpm adapor
Counterweight
Weight ring
Anti-skating control
Cueing control
Arm rest
Arm clamp
Tonearm
Locking sleeve
Headshell/cartridge
Stop switch
Technics


Pitch control VR (VR201)
Speed selector switch (S201)
Neon lamp P.C.B.
A Drive circuit P.C.B.
Power transformer (T1)
B Power source circuit P.C.B.
Stop rod
Stator frame
Automatic mechanism plate
Power switch (S1)
Shield plate

■ DISASSEMBLY INSTRUCTIONS

• How to remove the bottom board and automatic mechanism plate

1. Fix the tonearm on the rest.
2. Remove the turntable.
3. Close the dust cover, and turn over the unit, taking care not to scratch it.
4. Remove the bottom board setscrews ① ~ ⑧. Then, the bottom board can be removed. **(See Fig. 1)**
5. Remove the shield plate setscrews ⑨ and ⑩. **(See Fig. 2)**
6. Remove the regulator transistor P.C.B. setscrew ⑪. **(See Fig. 2)**
7. Remove the earth lead wire setscrew ⑫.
8. Remove the automatic mechanism plate setscrews ⑬ ~ ⑰. Then the automatic mechanism plate can be removed. **(See Fig. 2)**

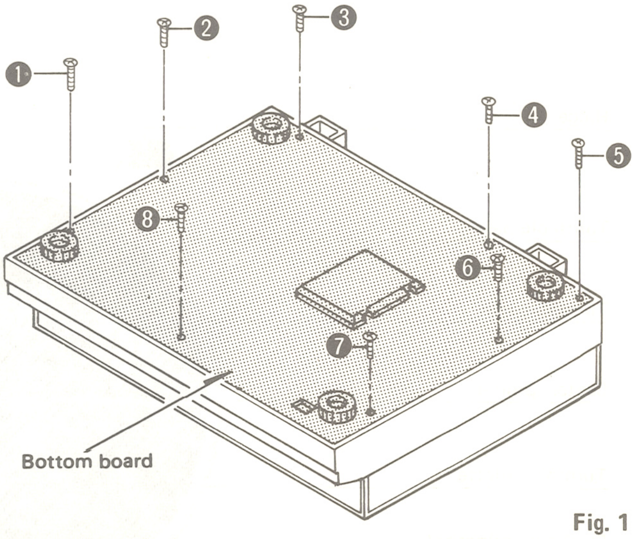

①
②
③
④
⑤
⑥
⑦
⑧
Bottom board

Fig. 1

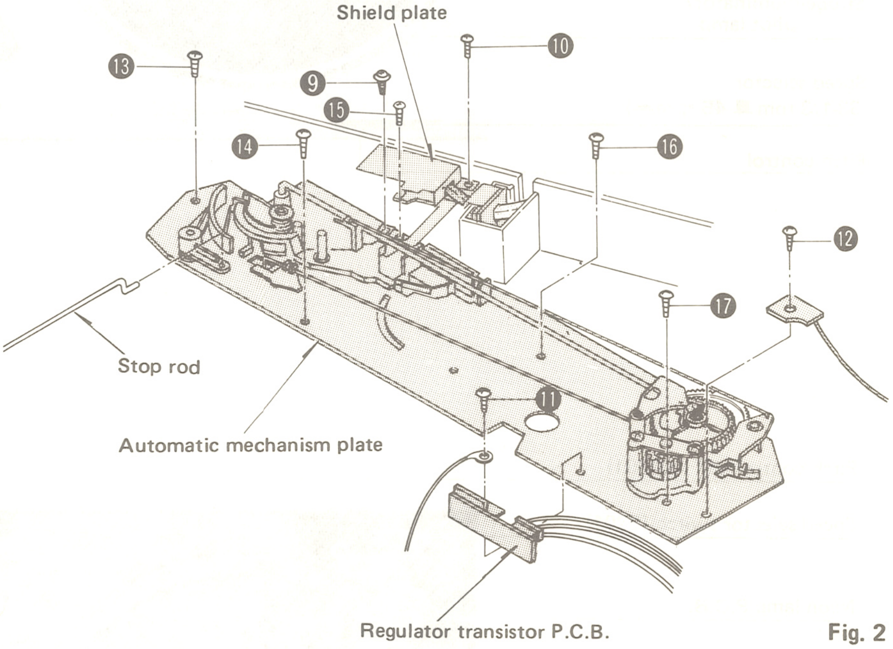

Shield plate
⑩
⑬
⑨
⑮
⑭
⑯
⑫
⑰
Stop rod
⑪
Automatic mechanism plate
Regulator transistor P.C.B.

Fig. 2

• How to remove the stator frame

1. Remove the bottom board and automatic mechanism plate. **(Refer to "How to remove the bottom board and automatic mechanism plate".)**
2. Open the "lead holder" of the lead connector and pull out the lead wire of the arrow Ⓐ in **Fig. 3.**
3. Remove the stator frame setscrews ⑱ ~ ⑳. Then, the stator frame can be removed. **(See Fig. 3)**

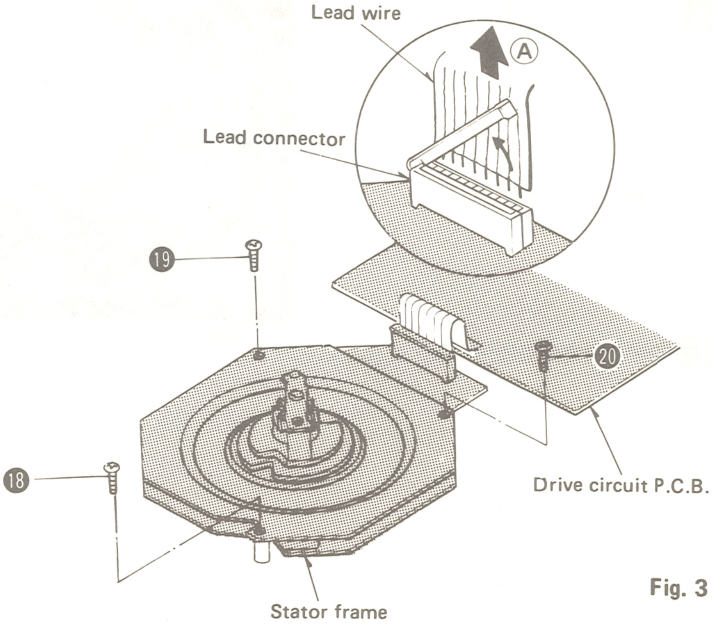

Lead wire
Ⓐ
Lead connector
⑲
⑳
⑱
Drive circuit P.C.B.
Stator frame

Fig. 3

● How to remove the drive circuit P.C.B.

1. Remove the bottom board. **(Refer to "How to remove the bottom board and automatic mechanism plate".)**
2. Open the "lead holder" of the lead connector and pull out the lead wire. **(Refer to "How to remove the stator frame")**
3. Remove the regulator transistor P.C.B. setscrew ⑪ and earth lead wire setscrew ⑫. **(See Fig. 2)**
4. Remove the drive circuit P.C.B. setscrews ㉑ ~ ㉓. Then, the drive circuit P.C.B. can be removed. **(See Fig. 4)**

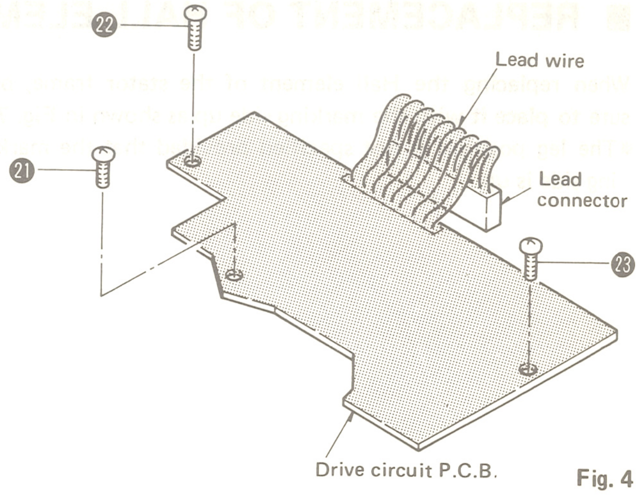

㉒
Lead wire
㉑
Lead connector
㉓
Drive circuit P.C.B.

Fig. 4

● How to remove the tonearm and lift base plate

1. Remove the bottom board and automatic mechanism plate. **(Refer to "How to remove the bottom board and automatic mechanism plate".)**
2. Remove the canceller spring from the PU fixing plate, loosen the PU fixing plate setscrew ㉔ with a hexagon wrench, then the PU fixing plate is disassembled when lifted upward. **(See Fig. 5)**
3. Disconnect the soldered five lead wires from the tonearm. **(See Fig. 5)**
4. Disengage the screw ㉕ of the lead wire fixing plate and remove the tonearm stopper, then the tonearm can be taken off. **(See Fig. 5)**
5. To disassemble the lift substrate, diseangage the arm lift fixing screw ㉖ before turning over the body, then remove the arm lift. **(See Fig. 6)**

   Note: Remove the spring under the arm lift at the same time.
6. Remove the anti-skating control knob. **(See Fig. 6)**
7. Turn over the unit and remove the PU fixing plate.
8. Remove the lift base plate setscrews ㉗ ~ ㉙. Then, the lift base plate can be removed. **(See Fig. 5)**

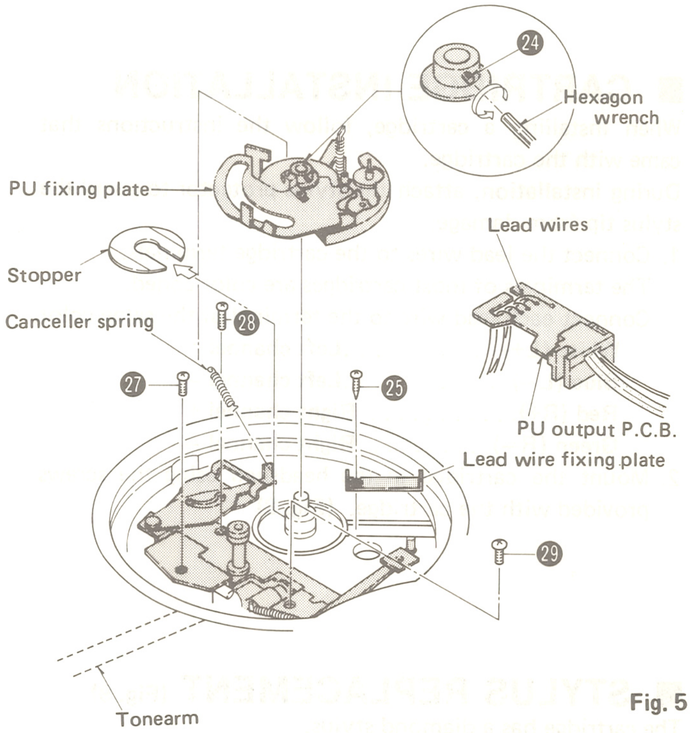

㉔
Hexagon wrench
PU fixing plate
Lead wires
Stopper
Canceller spring
㉘
㉗
㉕
PU output P.C.B.
Lead wire fixing plate
㉙
Tonearm

Fig. 5

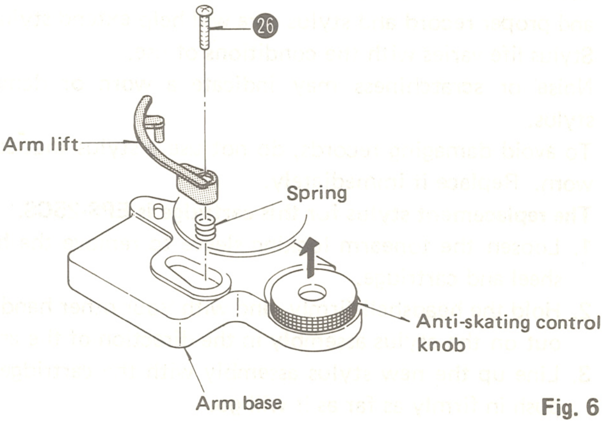

㉖
Arm lift
Spring
Anti-skating control knob
Arm base

Fig. 6

■ REPLACEMENT OF HALL ELEMENT

When replacing the Hall element of the stator frame, be sure to place it with the marking side up as shown in **Fig. 7.**

※The leg position is not specified provided that the marking side is up.

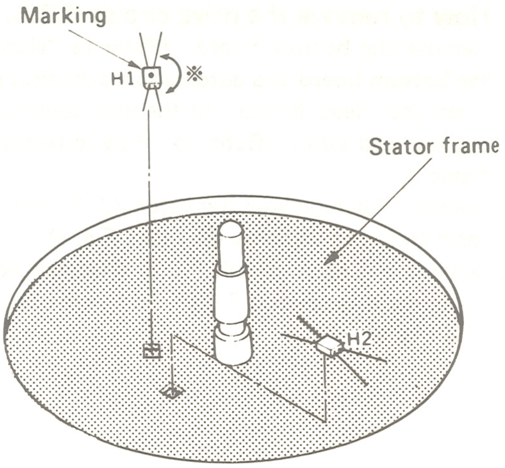


Fig. 7

■ CARTRIDGE INSTALLATION

When installing a cartridge, follow the instructions that came with the cartridge.

During installation, attach the stylus protector to guard the stylus tip from damage.

1. Connect the lead wires to the cartridge terminals.
   The terminals of most cartridges are color coded.
   Connect each lead wire to the terminal of the same color.
   White (L+) . . . .**Left channel +**
   Blue (L–) . . . .**Left channel –**
   Red (R+). . . . . **Right channel +**
   Green (R–). . . . . **Right channel –**
2. Mount the cartridge in the headshell using the screws provided with the cartridge. **(Fig. 8)**

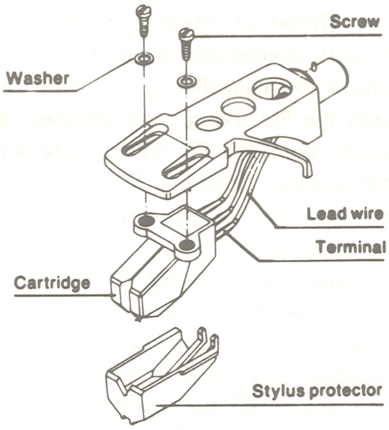


Fig. 8

■ STYLUS REPLACEMENT (Fig. 9)

The cartridge has a diamond stylus.

Replace the stylus at the first sign of wear or after about 1000 hours of use. Correct stylus pressure (tracking force) and proper record and stylus care will help extend stylus life. Stylus life varies with the conditions of use.

Noise or scratchiness may indicate a worn or damaged stylus.

To avoid damaging records, do not use a stylus that seems worn. Replace it immediately.

The replacement stylus for this cartridge is EPS-25CS.

1. Loosen the tonearm locking sleeve to remove the headsheel and cartridge.
2. Hold the headshell firmly, and with your other hand pull out on the stylus assembly in the direction of the arrow.
3. Line up the new stylus assembly with the cartridge and push in firmly as far as it will go.

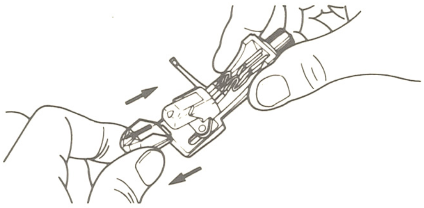


Fig. 9

■ MEASUREMENTS AND ADJUSTMENTS

English

• Arm-lift height adjustment

The arm-lift height (distance between the stylus tip and record surface when the cueing control is set to the " ▼ " position) has been adjusted at the factory to approximately 5 mm (3/16"). **(Fig. 10)**

If the clearance is too narrow or too wide (because of different cartridge dimensions, for example), turn the adjustment screw clockwise or counterclockwise.

(See Fig. 11)

Clockwise rotation

—distance between the record and stylus tip is decreassed.

Counterclockwise rotation

—distance between the record and stylus tip is increased.

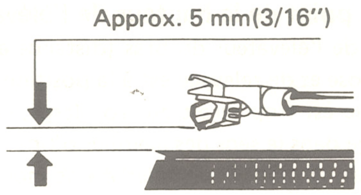


Fig. 10
(Abb. 10)

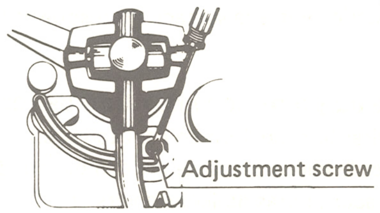


Fig. 11
(Abb. 11)

• Adjustment of automatic return position (Fig. 12)

1. Put the stylus protector on the cartridge.
2. Take off the rubber cap covering the adjustment screw section and move the tonearm toward the center of the record.
   Then, the auto-return position adjustment screw will appear.
   If the tonearm tends to return to the arm rest before the play has finished,
   —turn counterclockwise.
   If the tonearm fails to return after the final groove,
   —turn clockwise.

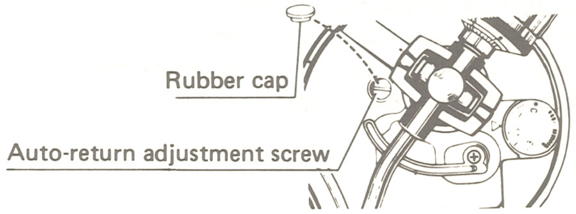


Fig. 12
(Abb. 12)

• Overhang adjustment (Fig. 13)

15 mm is the correct overhang for this tonearm.

Loosen the screws and move the cartridge forward or backward until the distance between the stylus tip and the plug becomes 52 mm (2-3/64").

Tigthen the screws without moving the cartridge.

Adjust the horizontal zero balance, stylus pressure and arm-lift height whenever you change the cartridge.

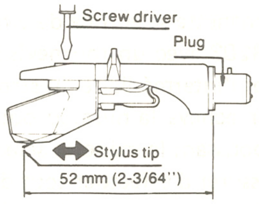


Fig. 13
(Abb. 13)

• Adjustment of rotational speed

After replacement of drive IC (IC101) and variable resistors (VR202, 203) or when the rated speed is not obtained by tuning the pitch control knob, perform the adjustment according to the following procedure.

1. Remove the bottom board. **(Refer to "Disassembly Instructions".)**
2. Place the set on the player repair table.
3. Put on the record and play.
4. Push the speed selector button to "45 r.p.m.".
5. Turn the pitch control knob to central position. **(See Fig. 14)**
6. Adjust VR202 by the screwdriver from under the set until the rated speed (45 r.p.m.) is obtained while checking it through the stroboscope. **(See Fig. 15)**
7. Push the speed selector button to "33 r.p.m.".
8. Adjust VR203 by the screwdriver until the rated speed (33-1/3 r.p.m.) is obtained while checking it through the stroboscope. **(See Fig. 15)**
9. After completing the above-mentioned adjustment, check that the rated speeds can be obtained by pushing the speed selector button.

Note: Be sure to perform the adjustment of 45 r.p.m. first.

10. As a simple method, it is also possible to adjust VR202 and VR203, removing the turntable. **(See Fig. 16)**

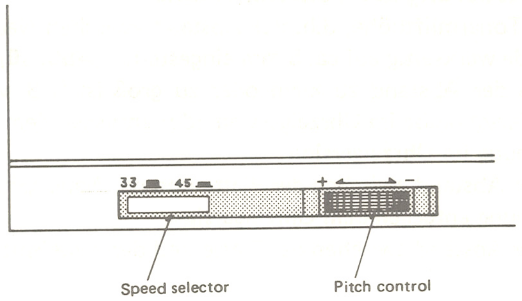


Fig. 14
(Abb. 14)

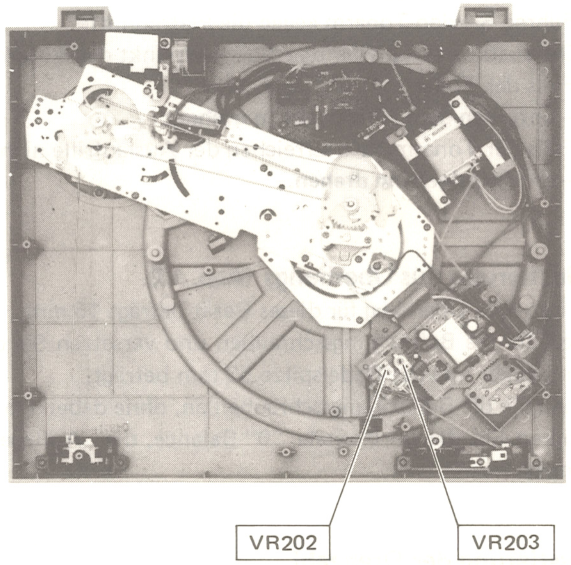


Fig. 15
(Abb. 15)

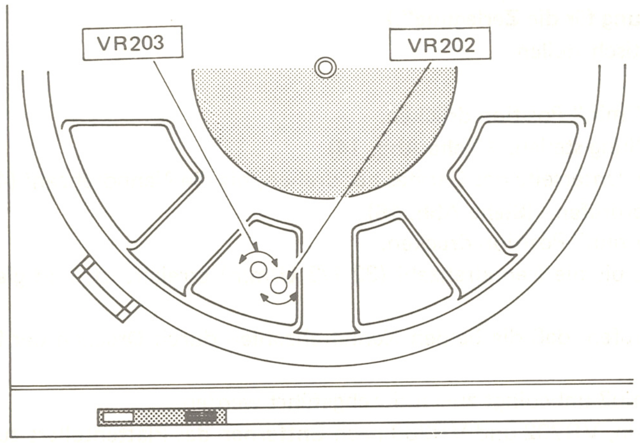


Fig. 16
(Abb. 16)

■ MESSUNGEN UND JUSTIERUNGEN Deutsch

• Justierung der Tonarmlifthöhe

Die Tonarmlifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position "▼", wurde werkseitig auf ca. 5 mm eingestellt. **(Abb. 10)**

Falls der Abstand zu klein oder zu groß ist (z.B. wegen der unterschiedlichen Tonabnehmer-Abmessungen, drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn. **(Abb. 11)**

Drehung im Uhrzeigersinn

–Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.

Drehung entgegen dem Uhrzeigersinn

–Der Abstand zwischen der Platte und der Nadelspitze wird größer.

• Justierung des Abschaltpunktes der Automatik (Abb. 12)

(Die Gummikappe abnehmen)

1. Setzen Sie den Nadelschutz auf den Tonabnehmer auf.
2. Führen Sie den Tonarm gegen die Plattenmitte.
   Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.
   Falls der Tonarm zu früh zurückkehrt.
   –Entgegen dem Uhrzeigersinn drehen.
   Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.
   –Im Uhrzeigersinn drehen.

• Justierung dus Überhangs (Abb. 13)

Der korrekte Überhang für dieses Gerät beträgt 15 mm.

Lösen Sie die Befestigungsschrauben und versetzen Sie den Tonabnehmer vorwärts oder rückwärts, bis der Abstand zwischen dem Stecker und der Nadelspitze 52 mm beträgt.

Ziehen Sie die Befestigungsschrauben an, ohne dabei den Tonabnehmer zu verschieben.

Justieren Sie die horizontale "0"-Balance, die Auflagekraft und die Tonarmlifthöhe nach jedem Auswechseln des Tonabnehmers.

• Justierung der Drehzahl

Nach dem Ersetzen des Antriebs-IC (IC101) und der Drehwiderstände (VR202, VR203), oder wenn die Einstellung der Nenndrehzahl durch Drehen des Drehzahl-Feineinstellers nicht möglich ist, muß die Justierung auf folgende Weise vorgenommen werden.

1. Die Bodenplatte abnehmen. **(Siehe "Anleitung für die Zerlegung".)**
2. Das Gerät auf den Plattenspieler-Reparaturtisch stellen.
3. Eine Platte auflegen und abspielen.
4. Die Drehzahl-Wahlschaltertaste in die "45 U/min"-Position drücken.
5. Den Drehzahl-Feineinsteller in die Mittelstellung stellen. **(Siehe Abb. 14)**
6. VR202 mit einem Schraubenzieher von der Unterseite des Gerätes her drehen, bis die Nenndrehzahl (45 U/min) erreicht ist, und gleichzeitig auf dem Stroboskop überprüfen. **(Siehe Abb. 15)**
7. Die Drehzahl-Wahlschaltertaste in die "33 U/min"-Position drücken.
8. VR203 mit einem Schraubenzieher drehen, bis die Nenndrehzahl (33-1/3 U/min) erreicht ist, und gleichzeitig auf dem Stroboskop überprüfen. **(Siehe Abb. 15)**
9. Nach Beenden der obigen Justierung überprüfen, daß die beiden Nenndrehzahlen durch Drücken der Drehzahl-Wahlschaltertaste erreicht werden können.
   Anmerkung: Die Justierung für 45 U/min muß unbedingt zuerst durchgeführt werden.
10. Eine einfache mögliche Methode besteht darin, VR202 und VR203 nach Entfernen des Plattentellers zu justieren. **(Siehe Abb. 16)**

■ MESURAGES ET RÉGLAGES Français

• Mise au point de la hauteur de l'élévateur du bras

La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position "▼") a été réglée en usine sur approximativement 5 mm. **(Fig. 10)**

Si l'intervalle est trop étroit ou trop large, (à cause, par exemple, des différentes dimensions de cellules pick-up), tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inverse. **(Fig. 11)**

Rotation dans le sens des aiguilled d'une montre.

–La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.

Rotation dans le sens contraire des aiguilles d'une montre.

–La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.

• Mise au point de la position de retour automatique (Fig. 12)

(Retirer le capuchon en caoutchouc.)

1. Placer le capot protecteur de la pointe de lecture sur la cellule pick-up.
2. Déplacer le bras de lecture vers le centre de disque.
   Alors, la vis de réglage du retour automatique apparaîtra.
   Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée.
   –Tourner dans le sens contraire des aiguilles d'une montre.
   Si le bras de lecture ne peut revenir en arrière après le dernier sillon.
   –Tourner dans le sens des aiguilles d'une montre.

• Réglage du surplomb (Fig. 13)

Le surplomb approprié pour ce bras de lecture est de 15 mm.

Desserrer les vis et déplacer la cellule vers l'avant ou vers l'arrière jusqu'à ce que la distance entre l'extrémité de la pointe de lecture et la fiche soit de 52 mm.

Serrer les vis sans faire bouger la cellule.

Mettre au point l'équilibrage zéro horizontal, la force verticale d'appui de la pointe de lecture et la hauteur du bras élévateur chaque fois que vous changez de cellule.

• Réglage de la vitesse rotationnelle

Après le remplacement du circuit intégré excitateur (IC101) et des résistances variables (VR202, VR203) ou lorsque la vitesse nominale de rotation n'est pas obtenue en tournant la manette de réglage d'écart, effectuer la mise au point selon le mode opératoire suivant.

1. Retirer le panneau de la face inférieure. **(Se référer aux "Instructions de Démontage".)**
2. Placer l'appareil sur la table de dépannage pour électrophones.
3. Placer un disque et faire jouer.
4. Pousser la manette sélectrice de vitesse sur "45 r.p.m." (45 t/p.m.).
5. Tourner la manette de réglage d'écart sur la position centrale. **(Voir Fig. 14)**
6. Ajuster VR202 avec un tournevis à partir du dessous de l'appareil jusqu'à ce que la vitesse nominale de rotation (45 t/p.m.) soit obtenue tout en la vérifiant par l'intermédiaire du stroboscope. **(Voir Fig. 15)**
7. Pousser la manette sélectrice de vitesse sur "33 r.p.m." (33 t/p.m.).
8. Ajuster VR203 avec un tournevis jusqu'à ce que la vitesse nominale de rotation (33-1/3 t/p.m.) soit obtenue tout en la vérifiant par l'intermédiaire du stroboscope. **(Voir Fig. 15)**
9. Après avoir achevé la mise au point mentionnée cidessus, vérifier si les vitesses nominales de rotation peuvent être obtenues en poussant la manette sélectrice de vitesse.
   Nota: S'assurer d'effectuer tout d'abord la mise au point de 45 t/p.m.
10. Comme méthode plus simplifiée, il est possible aussi d'ajuster VR202 et VR203 en retirant la platine. **(Voir Fig. 16)**

MEDICIONES Y AJUSTES Español

• Ajuste de la altura de elevación del brazo

La altura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superficie del disco cuando el control de colocación está en la posición "▼") ha sido regulada en la fábrica aproximadamente a 5 mm. **(Fig. 10)**

En caso que el espacio libre fuese demasiado estrecho o demasiado abundante (debido, por ejemplo, a la diferencia en dimensiones de los cartuchos), girar el tornillo de ajuste hacia la derecha o hacia la izquierda. **(Fig. 11)**

Rotación hacia la derecha

—reduce la distancia entre el disco y la punta de la aguja.

Rotación hacia la izquierda

—aumenta la distancia entre el disco y la punta de la aguja.

• Ajuste de la posición para retorno automático (Fig. 12)

(Quitar la tapita de goma.)

1. Colocar la protección de la aguja en el cartucho.
2. Mover el brazo sonoro hacia el centro del disco.
   Con ello, aparecerá el tornillo de ajuste del retorno automático.
   Cuando el brazo sonoro tienda a volver a su apoyo antes de terminar la ejecución:
   —Girar hacia la izquierda.
   En caso que el brazo sonoro no vuelva después de haber tocado el último surco del disco:
   —Girar hacia la derecha.

• Ajuste de la proyección (Fig. 13)

La proyección correcta para este cartucho es de 15 mm.

Aflojar los tornillos y mover el cartucho para adelante y para atrás hasta que la distancia entre la punta de la aguja y la clavija sea de 52 mm.

Apretar los tornillos sin mover el cartucho.

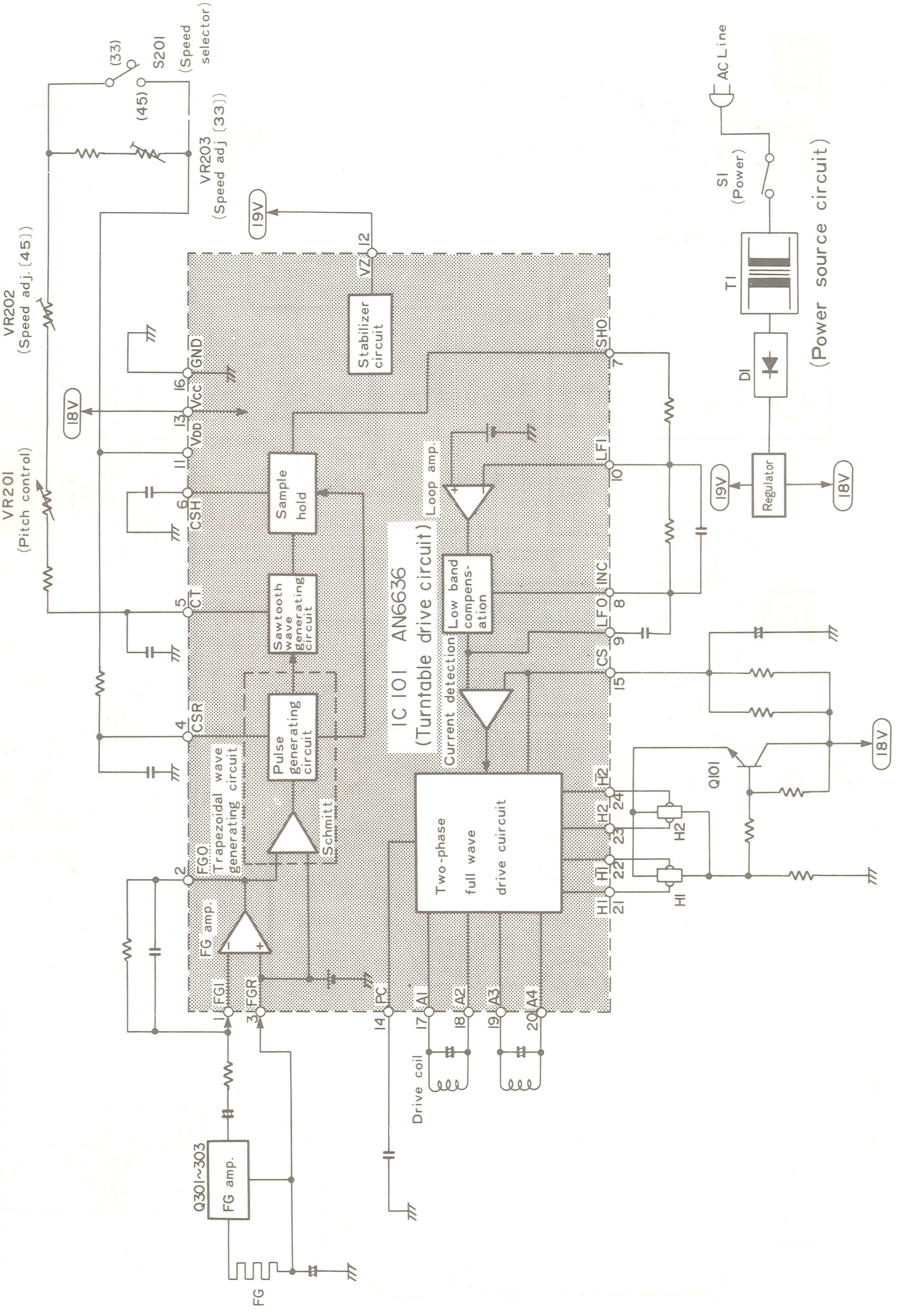
Regular el equilibrio horizontal a cero, la presión de la aguja y la altura de elevación del brazo toda vez que se cambia el cartucho.

• Ajuste de velocidad rotacional

Después del reemplazo de IC de impulsión (IC101) y resistores variables (VR202, VR203) o cuando no se obtenga la velocidad nominal girando la perilla de control de altura, efectúe el ajuste según el siguiente procedimiento:

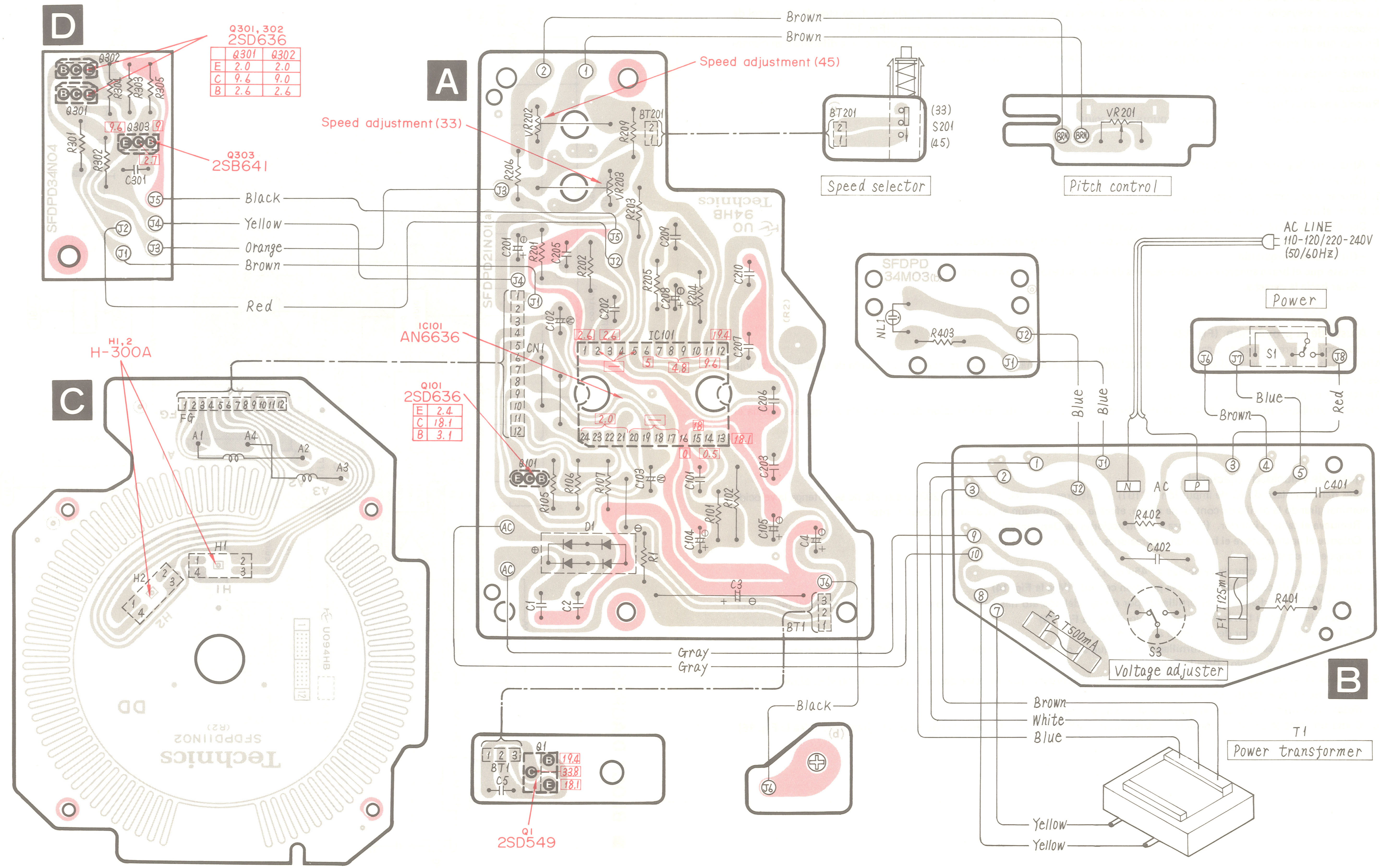
1. Remueva el tablero inferior. **(Refiera a "Instrucciones de Desmontaje".)**
2. Coloque el aparato sobre el banco de reparaciones para tocadiscos.
3. Ponga el disco y toque.
4. Apriete el botón selector de velocidad a "45 r.p.m.".
5. Gire la perilla de control de altura a la posición central. **(Vea la Fig. 14)**
6. Ajuste VR202 mediante el destornillador por debajo del aparato hasta que se obtenga la velocidad nominal (45 r.p.m.) mientras la verifica a través del estroboscopio. **(Vea la Fig. 15)**
7. Apriete el botón selector de velocidad a "33 r.p.m.".
8. Ajuste VR203 mediante el destornillador hasta que se obtenga la velocidad nominal (33-1/3 r.p.m.) mientras la verifica a través del estroboscopio. **(Vea la Fig. 15)**
9. Después de completar el ajuste mencionado arriba, compruebe que las velocidades nominales se puedan obtener apretando el botón selector de velocidad.
   Nota: Asegúrese de efectuar el ajuste de 45 r.p.m. primero.
10. Como un método simple, es posible también ajustar VR202 y VR203, removiendo el plato giradiscos. **(Vea la Fig. 16)**

■ BLOCK DIAGRAM


(33)
(45)
S201
(Speed selector)
VR203
(Speed adj (33))
VR202
(Speed adj (45))
VR201
(Pitch control)
19V
18V
VZ 12
Stabilizer circuit
GND 16
Vcc 13
VDD 11
CSH 6
CT 5
CSR 4
FGO 2
FGI 1
FGR 3
PC 14
Sample hold
Sawtooth wave generating circuit
Pulse generating circuit
Trapezoidal wave generating circuit
Schmitt
FG amp.
IC 101 AN6636
(Turntable drive circuit)
Loop amp.
Low band compensation
Current detection
Two-phase full wave drive cuircuit
SHO 7
LFI 10
INC 8
LFO 9
CS 15
H2 24
H2 23
H1 22
H1 21
A1 17
A2 18
A3 19
A4 20
Drive coil
H2
H1
Q101
Q301~303
FG amp.
FG
AC Line
S1
(Power)
T1
D1
Regulator
(Power source circuit)

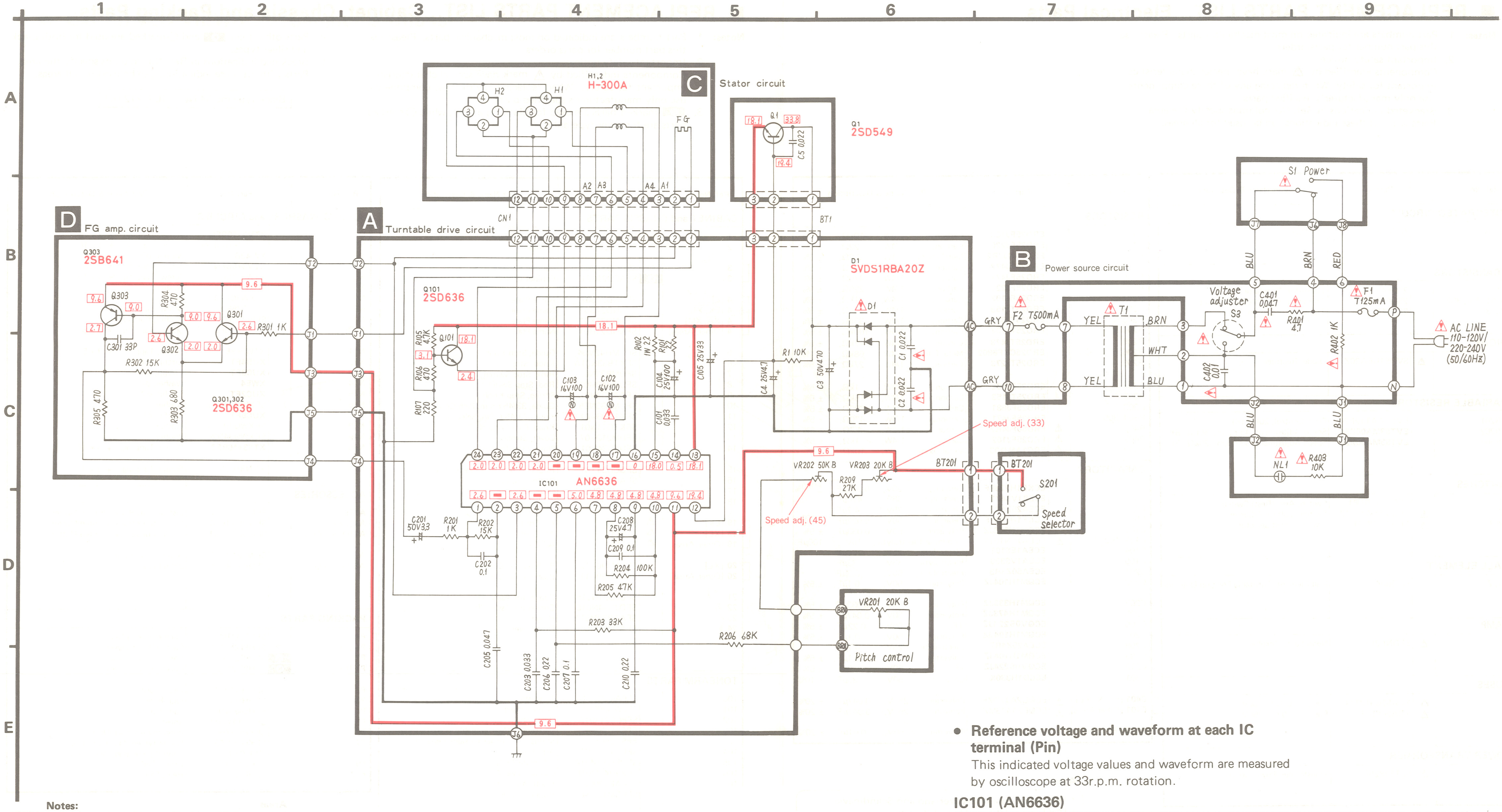
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

🟥 Ground (Earth) lines


D
Q301, 302
2SD636
Q301 Q302
E 2.0 2.0
C 9.6 9.0
B 2.6 2.6
Q302
Q301
R304 R303 R305
R301 R302
Q303
9.6 9 2.7
C301
Q303
2SB641
SFDPD34NO4
J5 J4 J3 J2 J1
Black
Yellow
Orange
Brown
Red
A
Brown
Brown
Speed adjustment (45)
Speed adjustment (33)
VR202 VR203 BT201 R209 R206 R203 J3
BT201
(33)
S201
(45)
Speed selector
VR201
BRN BRN
Pitch control
Technics
94HB
SFDPD21NO1
C201 R201 C205 R202 C204 J5 J2 J4 J1
R205 C208 R204 C210
C102 C202
CN1
1 2 3 4 5 6 7 8 9 10 11 12
IC101
AN6636
IC101
2.6 2.6 19.4
1 2 3 4 5 6 7 8 9 10 11 12
5 4.8 9.6
C207 C206
2.0
24 23 22 21 20 19 18 17 16 15 14 13
18 18.1
0 0.5
C203
Q101
2SD636
E 2.4
C 18.1
B 3.1
Q101
R105 R106 R107 C103 C101 R101 R102 C104 C105 C4
AC AC
D1
R1
C3
C1 C2
J6
BT1
3 2 1
Gray
Gray
Black
J6
(d)
1 2 3
BT1
C5
Q1
B 19.4
C 33.8
E 18.1
Q1
2SD549
SFDPD
34MO3
NL1
R403
J2 J1
Blue
Blue
AC LINE
110-120/220-240V
(50/60Hz)
Power
J6 J7 S1 J8
Blue
Brown
Red
B
1 2 3 J1 J2 N AC P 3 4 5
C401
R402
9 10
C402
8 7
F1 T125mA
R401
F2 T500mA
S3
Voltage adjuster
Brown
White
Blue
T1
Power transformer
Yellow
Yellow
H1, 2
H-300A
C
FG
1 2 3 4 5 6 7 8 9 10 11 12
A1 A4 A2 A3
H1
1 4 2 3
H2
2 3 1 4
DD
SFDPD11ONZ
(R2)
Technics
U094HB

SCHEMATIC DIAGRAM

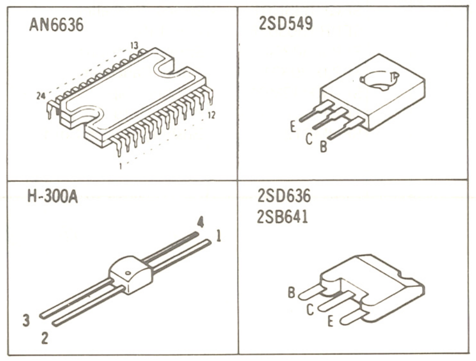
(This schematic diagram may be modified at any time with the development of new technology.)


1
2
3
4
5
6
7
8
9
A
B
C
D
E
C Stator circuit
H1,2 H-300A
H2
H1
FG
A2 A3 A4 A1
Q1 2SD549
C5 0.022
BT1
CN1
D FG amp. circuit
Q303 2SB641
Q303
Q302
Q301
R304 470
R301 1K
C301 33P
R302 15K
R305 470
R303 680
Q301,302 2SD636
A Turntable drive circuit
Q101 2SD636
R105 4.7K
R106 470
R107 220
C103 16V100
C102 16V100
R102 1W 22
R101 33
C104 25V100
C101 0.033
C105 25V33
C4 25V4.7
R1 10K
C3 50V470
C1 0.022
C2 0.022
D1 SVDS1RBA20Z
D1
IC101 AN6636
C201 50V3.3
R201 1K
R202 15K
C202 0.1
C208 25V4.7
C209 0.1
R204 100K
R205 47K
R203 33K
R206 68K
C205 0.047
C203 0.033
C206 0.22
C207 0.1
C210 0.22
VR202 50K B
VR203 20K B
R209 2.7K
Speed adj. (33)
Speed adj. (45)
BT201
S201
Speed selector
VR201 20K B
Pitch control
B Power source circuit
F2 T500mA
T1
YEL
BRN
WHT
BLU
GRY
Voltage adjuster S3
C401 0.047
R401 4.7
C402 0.01
R402 1K
F1 T125mA
AC LINE 110-120V/220-240V (50/60Hz)
S1 Power
BLU
BRN
RED
NL1
R403 10K
J1 J2 J3 J4 J5 J6 J7 J8
9.6
18.1
19.4
33.8
2.0
18.0
0.5
2.6
5.0
4.8
8.0
9.0
2.7
3.1
2.4

Notes:

1. **S1** : Power (Arm) switch in “**on**” position.
2. **S3** : Voltage adjuster switch in “**220 – 240V**” position.
   110 — 120V ↔ 220 — 240V
3. **S201** : Speed selector switch in “**33-1/3 r.p.m.**” position.
   33-1/3 r.p.m. ↔ 45 r.p.m.
4. The value in ☐ in the standard voltage for this unit operated at 33-1/3 r.p.m., which was measured by DC electronic voltmeter (high impedance) on basis of the chassis. Accordingly, the voltage value may sometimes include a slight error depending on the internal impedance of the DC voltmeter (tester, etc.) used for the measurement.
5. Important safety notice:
   Components indentified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer’s specified parts.
6. ▬ + Ⓑ voltage line.

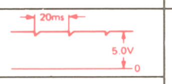
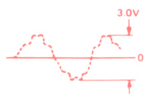
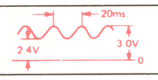
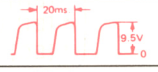
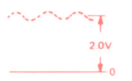
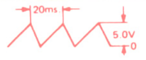
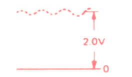
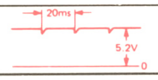
• Terminal guide of transistors and IC


AN6636
24
13
1
12
2SD549
E
C
B
H-300A
4
1
3
2
2SD636
2SB641
B
C
E

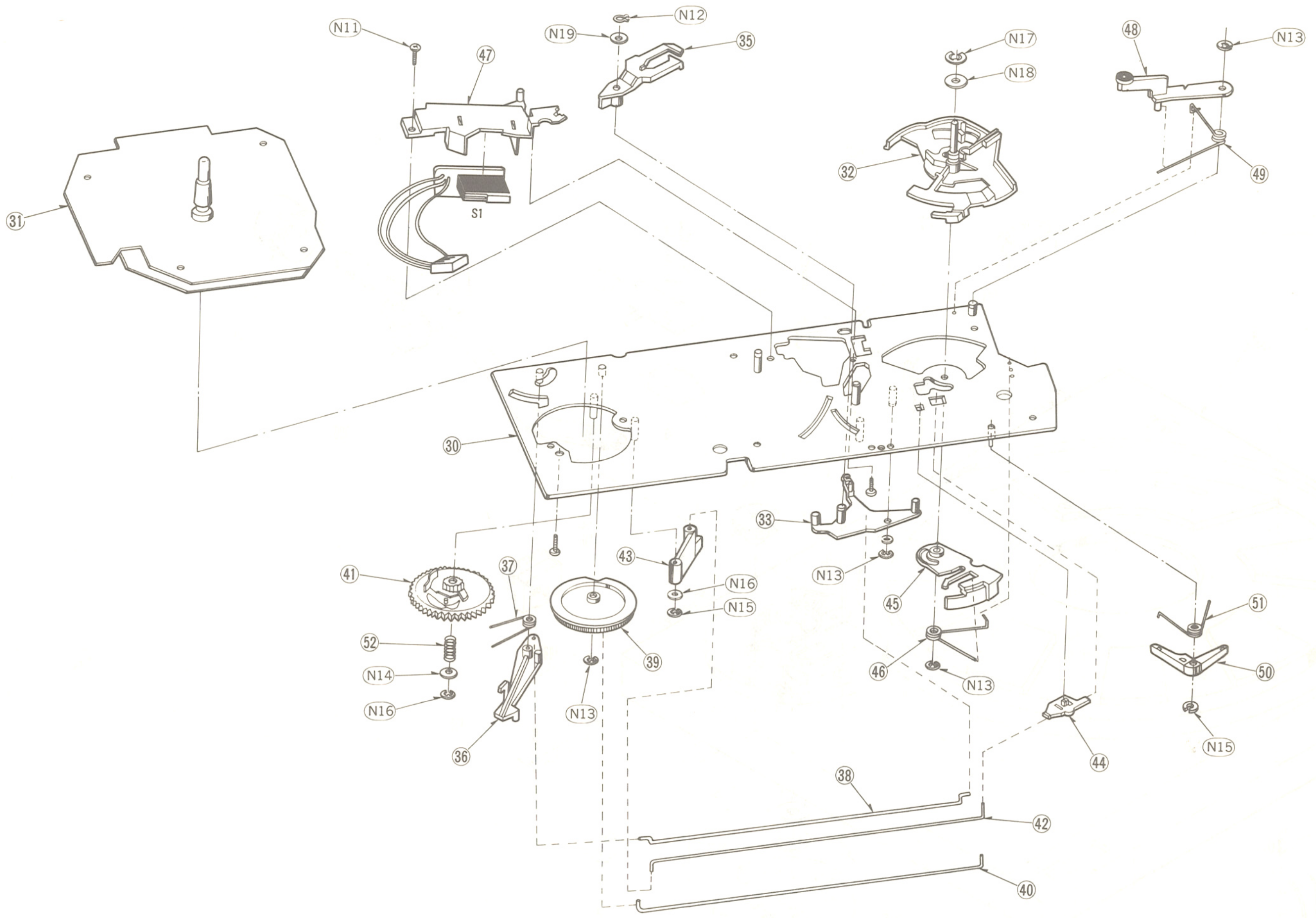
• Reference voltage and waveform at each IC terminal (Pin)

This indicated voltage values and waveform are measured by oscilloscope at 33r.p.m. rotation.

IC101 (AN6636)

Pin No.	Stop	Start	Pin No.	Stop	Start	Pin No.	Stop	Start
①	2.6V	2.6V	⑦	8.0V	 20ms 5.0V 0	⑰ ⑱ ⑲ ⑳	0V	 3.0V 0
②	2.6V	 20ms 2.4V 3.0V 0	⑧	0.2V	4.8V			
③	2.6V	2.6V	⑨	0.2V	4.8V			
④	9.4V	 20ms 9.5V 0	⑩	4.8V	4.8V	㉑ ㉔	2.1V	 2.0V 0
			⑪	9.6V	9.6V			
⑤	8.8V	 20ms 5.0V 0	⑫	19.4V	19.4V			
			⑬	18.1V	18.1V	㉒ ㉓	2.0V	 2.0V 0
⑥	8.2V	 20ms 5.2V 0	⑭	0V	0.5V			
			⑮	18.1V	18.0V			

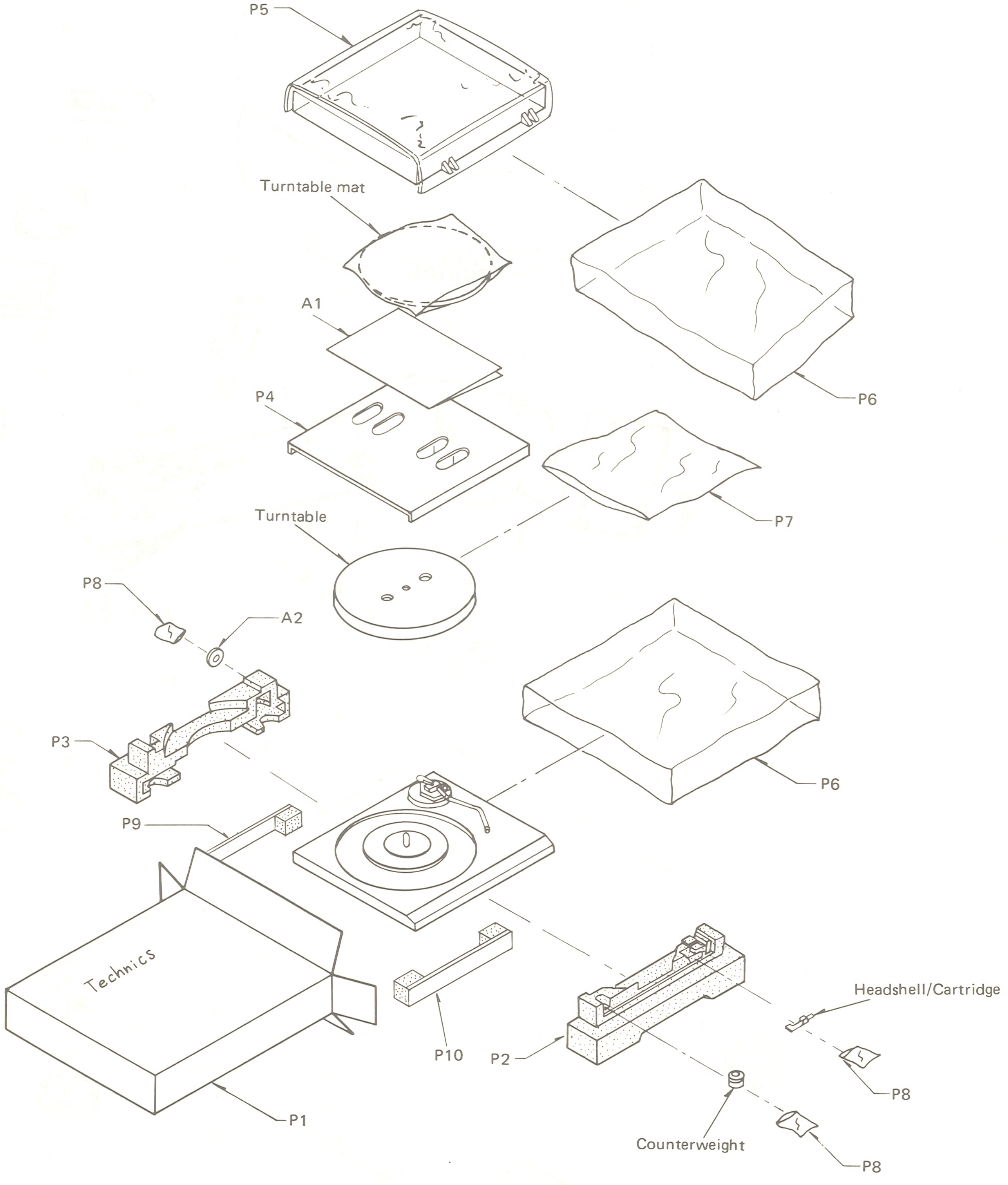
■ EXPLODED VIEWS……Automatic Mechanism Plate


N11
N19
N12
35
47
N17
N18
48
N13
31
S1
32
49
30
33
41
37
43
N16
N15
N13
45
51
52
N14
N16
39
46
N13
50
36
N13
44
N15
38
42
40

Ref. No.		Part No.	Part Name & Description
AUTOMATIC MECHANISM ASS'Y			
30		SFUKD21M21E	Plate, Automatic Mechanism
31		SFMZD34N01Z	Stater Frame Ass'y
32		SFUMQ22N03E	Cam, Drive
33		SFUMQ34N44	Lever, Switch
35		SFUMQ34N38	Lever, Stop
36		SFUMQ34N31	Plate, Stop Gear
37		SFQSQ34N21	Spring, Stop Gear
38		SFQSQ34N26	Rod, Switch
39		SFUGQ34N22	Gear, Drive
40		SFQSQ34N22	Rod, Drive

Ref. No.		Part No.	Part Name & Description
41		SFUGQ34N21E	Main Gear Ass'y
42		SFQSQ34N23	Rod, Actuating
43		SFUMQ34N42	Connector, Actuating
44		SFUMQ34N32	Support, Actuating Rod
45		SFUMQ22N02E	Cam, Start
46		SFQSQ22N01	Spring, Start
47		SFUMQ34N36	Case, Switch
48		SFUMQ34N43	Plate, Brake
49		SFQSQ34N28	Spring, Brake
50		SFUMB33N01	Lever, Start
51		SFQSB33N02	Spring, Start Lever
52		SFQAQ34N21	Spring, Main Gear

■ PACKINGS


P5
Turntable mat
A1
P6
P4
P7
Turntable
P8
A2
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P6
P9
Technics
Headshell/Cartridge
P10
P2
P8
P1
Counterweight
P8

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81079000 Ⓗ TK/YW

ORDER NO. SD81082022C4

Service Manual

Turntable System

SL-D212

[PA], [PE], [PC]

SL-D212(K)

[PA], [PE], [PC]

* The colors of this model included silver and black.
* The black type model is provided with (K) in the Service Manual.

Areas

* [PA] is available in far East PX.
* [PE] is available in European Military.
* [PC] is available in European Audio Club.

Please use this manual together with the service manual for Model No. SL-D212/SL-D212 (K), Order No. SD81071976C8.

Specifications

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown approximate.

■ General

Power supply:	~110–120/220–240V, 50 or 60 Hz
Power consumption:	7 W
Dimensions: (W×H×D)	43×10.6×37.5 cm (16-15/16"×4-7/32"×14-3/4") (Maximum height when top (dust cover) is open. 43×37×42 cm 16-15/16"×14-9/16"×16-17/32")
Weight:	5 kg (11 lb.)

■ Turntable section

Type:	Automatic turntable Auto return Auto stop Manual play
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	F·G servo control
Turntable platter	Aluminum die-cast Diameter 31.2 cm (12-9/32")
Turntable speeds:	33-1/3 rpm and 45 rpm
Pitch control:	10% adjustment range
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (IEC 98A Weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	−56 dB (IEC 98A Unweighted) −78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Universal tonearm "S" shaped tubular arm Static balanced type
Effective length:	230 mm (9-1/16")
Overhang:	15 mm (19/32")
Tracking error angle:	Within 2°32′ at the outer groove of 30 cm (12") record Within 0°32′ at the inner groove of 30 cm (12") record
Offset angle:	22°
Friction:	Less than 7 mg (lateral, vertical)
Effective mass:	11 g (without cartridge)
Stylus pressure adjustment range:	0–2.5 g
Headshell weight:	8 g
Phono cable capacitance:	135 pF

■ Cartridge section

Type:	Moving magnet stereo cartridge
Frequency response:	20 Hz to 25 kHz
Output voltage:	2.5 mV 1 kHz, 5 cm/s. zero to peak lateral velocity (7 mV 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	22 dB 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Load impedance:	47 kΩ to 100 kΩ
Stylus pressure:	1.75±0.25 g (17.5±2.5 mN)
Replacement stylus:	EPS-74STSD (ATN71)

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shiba-koen, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

CHANGES

■ REPLACEMENT PARTS LIST

Ⓚ–marked parts are used for black type only.

Ref. No.		Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
		SL-D212/D212 (K) (ORDER NO. SD81071976C8) ➡	SL-D212/D212 (K) [PA, PE, PC]			
CAPACITOR						
C401	⚠	ECQU2A473MF ECQE2A473MZ	ECQE2A473MZ	Polyester, 250VAC, 0.047μF, ± 20%	1	
CABINET and CHASSIS PARTS						
4		SFNND21S01 SFNND21G02	SFNND21P01 [PA, PE]	Name Plate	1	○
		SFNND21X01 SFNND21R01	SFNND21P02 [PC]	Name Plate	1	○
19	⚠	SJA139 SJA141 SJA137	**SJA83**	AC Cord	1	
20		SFUM190–12 SFUM190–11	SFUM190–12	Bushing, AC Cord	1	
TONEARM PARTS						
103		EPC–U25S	EPC74SMAD	Cartridge	1	
		EPS–25CS	EPS74STSD	Stylus	1	
SCREW and NUT						
N8		SFCZV8800	SFPEV7803	Screw, Cartridge	2	
N22		Addition	SFPEN3302	Nut, Cartridge	2	
ACCESSORIES						
A1		SFNUD21S01 SFNUD21G01 SFNUD21X01	SFNUD21P01	Instructions Book, Printed Matter	1	○
A3		SFDKI19118	Deletion	2 Pin Plug	0	
A4		Addition	QJP0603S	Adaptor, Gimens	1	
PACKING PARTS						
P1	○ ○	SFHPD21M01 SFHPD21C01	○ SFHPD21M01	Carton Box (Silver)	1	
	Ⓚ Ⓚ	SFHPD21M21 SFHPD21C21	Ⓚ SFHPD21M21	Carton Box (Black)	1	

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